Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD I05-005 H2867

DATE RECEIVED: 11/23/04 LVL LOT # :0411L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
B1BK40							
BROMIDE BY IC	002	W	04LIC069	11/22/04	11/23/04	11/23/04	
CHLORIDE BY IC	002	W	04LIC069	11/22/04	11/23/04	11/23/04	
FLUORIDE BY IC	002	W	04LIC069	11/22/04	11/23/04	11/23/04	
NITRITE BY IC	002	W	04LIC069	11/22/04	11/23/04	11/23/04	1405
NITRATE BY IC	002	W	04LIC069	11/22/04	11/23/04	11/23/04	1421
PHOSPHATE BY IC	002	W	04LIC069	11/22/04	11/23/04	11/23/04	1405
SULFATE BY IC	002	W	04LICA69	11/22/04	11/23/04	11/23/04	
LAB QC:							
BROMIDE BY IC	MB1	W	04LIC069	N/A	11/23/04	11/23/04	
BROMIDE BY IC	MB1 BS	W	04LIC069	N/A	11/23/04	11/23/04	
CHLORIDE BY IC	MB1	W	04LIC069	N/A	11/23/04	11/23/04	
CHLORIDE BY IC	MB1 BS	W	04LIC069	N/A	11/23/04	11/23/04	
FLUORIDE BY IC	MB1	W	04LIC069	N/A	11/23/04	11/23/04	
FLUORIDE BY IC	MB1 BS	W	04LIC069	N/A	11/23/04	11/23/04	
NITRITE BY IC	MB1	W	04LIC069	N/A	11/23/04	11/23/04	
NITRITE BY IC	MB1 BS	W	04LIC069	N/A	11/23/04	11/23/04	
NITRATE BY IC	MB1	W	04LIC069	N/A	11/23/04	11/23/04	
NITRATE BY IC	MB1 BS	W	04LIC069	N/A	11/23/04	11/23/04	
PHOSPHATE BY IC	MB1	W	04LIC069	N/A	11/23/04	11/23/04	
PHOSPHATE BY IC	MB1 BS	W	04LIC069	N/A	11/23/04	11/23/04	
SULFATE BY IC	MB1	W	04LICA69	N/A	11/23/04	11/23/04	
SULFATE BY IC	MB1 BS	W	04LICA69	N/A	11/23/04	11/23/04	

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD I05-005 H2868
LVL#: 0411L256

W.O.#: 11343-606-001-9999-00
Date Received: 11-23-04

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met (see the sample chronology summary for analyses times for short hold samples).

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix quality control analyses were inadvertently omitted due to an analyst's oversight.

8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

12/30/04
Date

njp\i11-256

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

02

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide ___Chloride ___Fluoride	___ 300.0	___ 9056	
___Nitrate ___Nitrite ___Phosphate	___ 300.0	___ 9056	
___Sulfate ___Formate ___Acetate ___Oxalate	___ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chlorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B ___ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b)
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
___Nitrate-Nitrite ___Nitrate ___Nitrite	___ 353.2		
Ammonia	___ 350.3		
Total___ Kjeldahl ___ Organic Nitrogen	___ 351.3		
Total___ Organic ___ Inorganic Carbon	___ 415.1	___ 9060	
Oil & Grease	___ 413.1	___ 9070	
___ pH ____ pH; paper	___ 150.1	___ 9040B __ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 __ 420.2	___ 9065 __ 9066	
___Ortho ___Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1	___ 9030B/9034 (acid soluble)	
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (__9014__9030B)	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach	___ 1312		
Total ___Dissolved __Suspended ___Solids	160 ___.1 ___.2 ___.3		
Total Organic Halides	___ 450.1	___ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
__Total __Dissolved __Suspended	___ 160.4		
Other:		**Method:**	

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 12/29/04

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B1BK40	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	25.5	MG/L	2.5	10.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	62.4	MG/L	2.50	10.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
		Sulfate by IC	133	MG/L	5.0	20.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 12/29/04

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	04LIC069-MB1	Bromide by IC	0.25 u	MG/L	0.25	1.0
		Chloride by IC	0.25 u	MG/L	0.25	1.0
		Fluoride by IC	0.25 u	MG/L	0.25	1.0
		Nitrite by IC	0.25 u	MG/L	0.25	1.0
		Nitrate by IC	0.25 u	MG/L	0.25	1.0
		Phosphate by IC	0.25 u	MG/L	0.25	1.0
BLANK10	04LICA69-MB1	Sulfate by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 12/29/04

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
BLANK10	04LIC069-MB1	Bromide by IC	5.1	0.25u	5.0	102.7	1.0
		Chloride by IC	4.9	0.25u	5.0	98.9	1.0
		Fluoride by IC	5.0	0.25u	5.0	100.1	1.0
		Nitrite by IC	4.83	0.25u	5.00	96.7	1.0
		Nitrate by IC	5.17	0.25u	5.00	103.3	1.0
		Phosphate by IC	4.9	0.25u	5.0	98.9	1.0
BLANK10	04LICA69-MB1	Sulfate by IC	5.0	0.25u	5.0	100.8	1.0

Lionville Laboratory Use Only
04111L256

Custody Transfer Record/Lab Work Request

Page 1 of 1

LVLI

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

See SRC

Client TNU Hanford 105.005

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager Orlette Johnson

QC Spec Del Std TAT 30 Days

Date Rec'd 11.23.04 Date Due 12/23/04

		VOA	BNA	Pest/PCB	Herb				Dis Metal (A)	CN	Metals (B)	IC Anions (C)			
Refrigerator #									3		3	3			
#/Type Container	Liquid								1P		1P	1P			
	Solid														
Volume	Liquid								500		500	500			
	Solid														
Preservatives									HNO3		HNO3				
ANALYSES REQUESTED →		ORGANIC							INORG						

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	MET① SO		MET① TO	IC①
001	B1BK38 (F)			W	11/22/04	0851	X			
002	B1BK40			↓	↓	↓			X	X

(Lionville Laboratory Use Only)

Special Instructions: RUN MATRIX QC

MET① = Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Sb, V, Zn

IC① = CL, Br, FL, NO3, NO2, SO4, PO4

DATE/REVISIONS:

1.
2.
3.
4. 0.8
5.
6.

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FedEx	D Smith	11/23/04	0950					"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

PNNL	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # I05-005-271
		Page 1 of 1

Collector ~~DURATEK~~ D. P. CONNOLLY	**Contact/Requester** DL STEWART	**Telephone No.** 509-376-5056 **MSIN** **FAX**
SAF No. I05-005	**Sampling Origin** HANFORD SITE	**Purchase Order/Charge Code**
Project Title CERCLA 100HR3IAM (1&2) GW MONITORING, NOVEMBER 2004	OTS - SAWS H83	**Ice Chest No.** SAWS-106 **Temp.**
Shipped To (Lab) Lionville Laboratory Incorporated	**Method of Shipment** GOVT. VEHICLE	**Bill of Lading/Air Bill No.** 792784202410
Protocol CERCLA	**Priority:** 45 Days	**Offsite Property No.**

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐
TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
Batch all PNNL GW samples submitted under "I05" SAF's into one SDG, not to exceed SDG closure of 14 days.
Submit invoices & deliverables to DL Stewart, PNNL

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1BK38 (F)		W	11-22-04	0851	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B1BK40		W			1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B1BK40		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B1BK40		W			1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	~~DURATEK~~ D. P. CONNOLLY		NOV 22 2004 1400	FED EX			
Relinquished By			Date/Time	Received By			Date/Time
Fed Ex			11-23-04 / 0950				11-23-04 / 0950
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford **Date:** 11-23-04

Purchase Order / Project# / SAF# / SOW# / Release #: 105.005

LvLI Batch # : 0411L256 **Sample Custodian:** D Smith

NOTE: EXPLAIN ALL DISCREPANCIES

1.	Samples Hand Delivered or Shipped	Carrier FedEx	Airbill# 7927 8428 2410	
2.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals Comments
3.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No	
5.	Samples received cooled or ambient?	Temp 6.8 °C		Cooler # SAW106
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals
7.	coc signed and dated?	☑ Yes	☐ No	
8.	Sample containers are intact?	☑ Yes	☐ No	
9.	All samples on coc received? All samples received on coc?	☑ Yes	☐ No	
10.	All sample label information matches coc?	☑ Yes	☐ No	
11.	Samples properly preserved?	☑ Yes	☐ No	
12.	Samples received within hold times? Short holds taken to wet lab?	☑ Yes	☐ No	
13.	VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14.	QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A
15.	Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No	
16.	Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)	☐ Yes	☐ No	☑ No Discrepancies

SR-002-B

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD I05-005 H2868

DATE RECEIVED: 11/23/04 LVL LOT # :0411L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, SOLUBLE	001 MS	W	04L0779	11/22/04	12/29/04	12/29/04
MANGANESE, SOLUBLE	001	W	04L0779	11/22/04	12/29/04	12/29/04
MANGANESE, SOLUBLE	001 REP	W	04L0779	11/22/04	12/29/04	12/29/04
MANGANESE, SOLUBLE	001 MS	W	04L0779	11/22/04	12/29/04	12/29/04
SODIUM, SOLUBLE	001	W	04L0779	11/22/04	12/29/04	12/29/04
SODIUM, SOLUBLE	001 REP	W	04L0779	11/22/04	12/29/04	12/29/04
SODIUM, SOLUBLE	001 MS	W	04L0779	11/22/04	12/29/04	12/29/04
NICKEL, SOLUBLE	001	W	04L0779	11/22/04	12/29/04	12/29/04
NICKEL, SOLUBLE	001 REP	W	04L0779	11/22/04	12/29/04	12/29/04
NICKEL, SOLUBLE	001 MS	W	04L0779	11/22/04	12/29/04	12/29/04
ANTIMONY, SOLUBLE	001	W	04L0779	11/22/04	12/29/04	12/29/04
ANTIMONY, SOLUBLE	001 REP	W	04L0779	11/22/04	12/29/04	12/29/04
ANTIMONY, SOLUBLE	001 MS	W	04L0779	11/22/04	12/29/04	12/29/04
VANADIUM, SOLUBLE	001	W	04L0779	11/22/04	12/29/04	12/29/04
VANADIUM, SOLUBLE	001 REP	W	04L0779	11/22/04	12/29/04	12/29/04
VANADIUM, SOLUBLE	001 MS	W	04L0779	11/22/04	12/29/04	12/29/04
ZINC, SOLUBLE	001	W	04L0779	11/22/04	12/29/04	12/29/04
ZINC, SOLUBLE	001 REP	W	04L0779	11/22/04	12/29/04	12/29/04
ZINC, SOLUBLE	001 MS	W	04L0779	11/22/04	12/29/04	12/29/04
B1BK40						
SILVER, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
ALUMINUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
BARIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
BERYLLIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
CALCIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
CADMIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
COBALT, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
CHROMIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
COPPER, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
IRON, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
POTASSIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
MAGNESIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
MANGANESE, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
SODIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
NICKEL, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
ANTIMONY, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04

Lionville Laboratory, Inc.
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TNUHANFORD I05-005 H2868

DATE RECEIVED: 11/23/04 LVL LOT # :0411L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04
ZINC, TOTAL	002	W	04L0779	11/22/04	12/29/04	12/29/04

LAB QC:

SILVER LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
SILVER, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
ALUMINUM LABORTORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
ALUMINUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
BARIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
BARIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
BERYLLIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
BERYLLIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
CALCIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
CALCIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
CADMIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
CADMIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
COBALT LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
COBALT, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
CHROMIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
CHROMIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
COPPER LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
COPPER, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
IRON LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
IRON, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
POTASSIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
POTASSIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
MAGNESIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
MAGNESIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
MANGANESE LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
MANGANESE, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
SODIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
SODIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
NICKEL LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
NICKEL, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
ANTIMONY LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
ANTIMONY, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
VANADIUM LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04

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TNUHANFORD I05-005 H2868

DATE RECEIVED: 11/23/04 LVL LOT # :0411L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
VANADIUM, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04
ZINC LABORATORY	LC1 BS	W	04L0779	N/A	12/29/04	12/29/04
ZINC, TOTAL	MB1	W	04L0779	N/A	12/29/04	12/29/04

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD I05-005
LVL#: 0411L256
SDG/SAF#: H2868/I05-005

W.O.#: 11343-606-001-9999-00
Date Received: 11-23-04

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 water samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

1/12/05
Date

jjw/m11-256

LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0411L256

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: X3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other:_____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	X6010B		__200.7				__99
Antimony	X6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	X6010B		__200.7				__99
Beryllium	X6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	X6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	X6010B		__200.7				__99
Chromium	X6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	X6010B		__200.7				__99
Copper	X6010B	__7211 [5]	__200.7	__220.2			__99
Iron	X6010B		__200.7				__99
Lead	__6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	X6010B		__200.7				__99
Manganese	X6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	X6010B		__200.7				__99
Potassium	X6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	X6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	X6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	X6010B		__200.7				__99
Zinc	X6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/10/05

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B1BK38	Silver, Soluble	1.0 u	UG/L	1.0	1.0
		Aluminum, Soluble	31.3 u	UG/L	31.3	1.0
		Barium, Soluble	81.1	UG/L	0.40	1.0
		Beryllium, Soluble	0.10 u	UG/L	0.10	1.0
		Calcium, Soluble	88800	UG/L	27.9	1.0
		Cadmium, Soluble	0.30 u	UG/L	0.30	1.0
		Cobalt, Soluble	0.70 u	UG/L	0.70	1.0
		Chromium, Soluble	231	UG/L	0.80	1.0
		Copper, Soluble	1.4 u	UG/L	1.4	1.0
		Iron, Soluble	27.9 u	UG/L	27.9	1.0
		Potassium, Soluble	5240	UG/L	18.9	1.0
		Magnesium, Soluble	18600	UG/L	6.9	1.0
		Manganese, Soluble	0.30 u	UG/L	0.30	1.0
		Sodium, Soluble	12600 C	UG/L	5.1	1.0
		Nickel, Soluble	1.2 u	UG/L	1.2	1.0
		Antimony, Soluble	2.8 u	UG/L	2.8	1.0
		Vanadium, Soluble	7.6	UG/L	0.70	1.0
		Zinc, Soluble	58.4 C	UG/L	1.3	1.0
-002	B1BK40	Silver, Total	1.0 u	UG/L	1.0	1.0
		Aluminum, Total	35.5	UG/L	31.3	1.0
		Barium, Total	81.8	UG/L	0.40	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Calcium, Total	89100	UG/L	27.9	1.0
		Cadmium, Total	0.30 u	UG/L	0.30	1.0
		Cobalt, Total	0.70 u	UG/L	0.70	1.0
		Chromium, Total	230	UG/L	0.80	1.0
		Copper, Total	1.4 u	UG/L	1.4	1.0
		Iron, Total	122	UG/L	27.9	1.0
		Potassium, Total	5840	UG/L	18.9	1.0
		Magnesium, Total	18600	UG/L	6.9	1.0
		Manganese, Total	0.64	UG/L	0.30	1.0
		Sodium, Total	12700 C	UG/L	5.1	1.0
		Nickel, Total	1.8	UG/L	1.2	1.0
		Antimony, Total	2.8 u	UG/L	2.8	1.0
		Vanadium, Total	7.4	UG/L	0.70	1.0
		Zinc, Total	62.4 C	UG/L	1.3	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/10/05

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	04L0779-MB1	Silver, Total	1.0 u	UG/L	1.0	1.0
		Aluminum, Total	31.3 u	UG/L	31.3	1.0
		Barium, Total	0.40 u	UG/L	0.40	1.0
		Beryllium, Total	0.10 u	UG/L	0.10	1.0
		Calcium, Total	27.9 u	UG/L	27.9	1.0
		Cadmium, Total	0.30 u	UG/L	0.30	1.0
		Cobalt, Total	0.70 u	UG/L	0.70	1.0
		Chromium, Total	0.80 u	UG/L	0.80	1.0
		Copper, Total	1.4 u	UG/L	1.4	1.0
		Iron, Total	27.9 u	UG/L	27.9	1.0
		Potassium, Total	18.9 u	UG/L	18.9	1.0
		Magnesium, Total	6.9 u	UG/L	6.9	1.0
		Manganese, Total	0.30 u	UG/L	0.30	1.0
		Sodium, Total	69.5	UG/L	5.1	1.0
		Nickel, Total	1.2 u	UG/L	1.2	1.0
		Antimony, Total	2.8 u	UG/L	2.8	1.0
		Vanadium, Total	0.70 u	UG/L	0.70	1.0
		Zinc, Total	1.3	UG/L	1.3	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/10/05

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B1BK38	Silver, Soluble	49.1	1.0 u	50.0	98.2	1.0
		Aluminum, Soluble	2060	31.3 u	2000	102.8	1.0
		Barium, Soluble	2080	81.1	2000	100.0	1.0
		Beryllium, Soluble	50.2	0.10u	50.0	100.4	1.0
		Calcium, Soluble	114000	88800	25000	99.4	1.0
		Cadmium, Soluble	49.1	0.30u	50.0	98.2	1.0
		Cobalt, Soluble	497	0.70u	500	99.4	1.0
		Chromium, Soluble	426	231	200	98.0	1.0
		Copper, Soluble	253	1.4 u	250	101.1	1.0
		Iron, Soluble	1030	27.9 u	1000	102.7	1.0
		Potassium, Soluble	32400	5240	25000	108.5	1.0
		Magnesium, Soluble	44300	18600	25000	103.0	1.0
		Manganese, Soluble	515	0.30u	500	103.1	1.0
		Sodium, Soluble	37400	12600	25000	99.0	1.0
		Nickel, Soluble	496	1.2 u	500	99.3	1.0
		Antimony, Soluble	510	2.8 u	500	101.9	1.0
		Vanadium, Soluble	502	7.6	500	98.9	1.0
		Zinc, Soluble	557	58.4	500	99.8	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/10/05

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B1BK38	Silver, Soluble	1.0 u	1.0 u	NC	1.0
		Aluminum, Soluble	31.3 u	38.7	~~NC~~ 20D MW 1/10/05	1.0
		Barium, Soluble	81.1	79.8	1.6	1.0
		Beryllium, Soluble	0.10u	0.10u	NC	1.0
		Calcium, Soluble	88800	87100	1.9	1.0
		Cadmium, Soluble	0.30u	0.30u	NC	1.0
		Cobalt, Soluble	0.70u	0.70u	NC	1.0
		Chromium, Soluble	231	226	2.1	1.0
		Copper, Soluble	1.4 u	1.4 u	NC	1.0
		Iron, Soluble	27.9 u	52.0	~~NC~~ 20D MW 1/10/05	1.0
		Potassium, Soluble	5240	5260	0.55	1.0
		Magnesium, Soluble	18600	18300	1.7	1.0
		Manganese, Soluble	0.30u	0.30u	NC	1.0
		Sodium, Soluble	12600	12500	0.81	1.0
		Nickel, Soluble	1.2 u	1.6	~~NC~~ 20D MW 1/10/05	1.0
		Antimony, Soluble	2.8 u	2.8 u	NC	1.0
		Vanadium, Soluble	7.6	7.6	0.00	1.0
		Zinc, Soluble	58.4	58.8	0.68	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 01/10/05

CLIENT: TNUHANFORD I05-005 H2868 LVL LOT #: 0411L256

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	04L0779-LC1	Silver, LCS	487	500	UG/L	97.4
		Aluminum, LCS	5080	5000	UG/L	101.6
		Barium, LCS	4900	5000	UG/L	98.1
		Beryllium, LCS	242	250	UG/L	96.6
		Calcium, LCS	25000	25000	UG/L	100.1
		Cadmium, LCS	245	250	UG/L	97.9
		Cobalt, LCS	2480	2500	UG/L	99.3
		Chromium, LCS	491	500	UG/L	98.2
		Copper, LCS	1230	1250	UG/L	98.7
		Iron, LCS	4930	5000	UG/L	98.7
		Potassium, LCS	26700	25000	UG/L	106.7
		Magnesium, LCS	25200	25000	UG/L	100.8
		Manganese, LCS	765	750	UG/L	101.9
		Sodium, LCS	25600	25000	UG/L	102.5
		Nickel, LCS	1980	2000	UG/L	98.9
		Antimony, LCS	3020	3000	UG/L	100.8
		Vanadium, LCS	2450	2500	UG/L	97.8
		Zinc, LCS	994	1000	UG/L	99.4

Lionville Laboratory Use Only

0411L256

Custody Transfer Record/Lab Work Request

Page 1 of 1

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

See SRC

Client TNU Hanford 105-005

Est. Final Proj. Sampling Date

Project # 11343-606-001-9999-00

Project Contact/Phone #

Lionville Laboratory Project Manager Charlotte Johnson

QC Spec Del Std TAT 30 Days

Date Rec'd 11-23-04 Date Due 12/23/04

		A	B	C
Refrigerator #		3	3	3
#/Type Container	Liquid	1P	1P	1P
	Solid			
Volume	Liquid	500	500	500
	Solid			
Preservatives		HNO3	HNO3	
ANALYSES REQUESTED →		ORGANIC: VOA, BNA, Pest/PCB, Herb	INORG: Dis Metal, CN	Metals, IC Anions

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Lionville Laboratory Use Only: METALSO	METALTO	ICO
001	B1BK38 (F)			W	11/22/04	0851	X		
002	B1BK40			J	J	J		X	X

Special Instructions: RUN MATRIX QC

MET① = Al, Ag, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Na, Ni, Sb, V, Zn

IC① = CL, Br, FL, NO3, NO2, SO4, PO4

DATE/REVISIONS:

1.
2.
3.
4. 0.8
5.
6.

Relinquished by	Received by	Date	Time
Fedex	D. Smith	11/23/04	0950

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time
"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

PNNL	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # I05-005-271
		Page 1 of 1

Collector ~~DURATEK~~ D. P. CONNOLLY	**Contact/Requester** DL STEWART	**Telephone No.** 509-376-5056 **MSIN** **FAX**
SAF No. I05-005	**Sampling Origin** HANFORD SITE	**Purchase Order/Charge Code**
Project Title CERCLA 100HR3IAM (1&2) GW MONITORING, NOVEMBER 2004	DTS - SAWS H83	**Ice Chest No.** SAWS-106 **Temp.**
Shipped To (Lab) Lionville Laboratory Incorporated	**Method of Shipment** GOVT. VEHICLE	**Bill of Lading/Air Bill No.** 792784202410
Protocol CERCLA	**Priority:** 45 Days	**Offsite Property No.**

POSSIBLE SAMPLE HAZARDS/REMARKS
** **

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐
TOTAL ACTIVITY EXEMPTION APPLIES UNLESS OTHERWISE STATED.
Batch all PNNL GW samples submitted under "I05" SAF's into one SDG, not to exceed SDG closure of 14 days.
Submit invoices & deliverables to DL Stewart, PNNL

Sample No.	Lab ID	*	Date	Time	No/Type Container	Sample Analysis	Preservative
B1BK38 (F)		W	11-22-04	0851	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B1BK40		W	↓	↓	1x500-mL G/P	ICP Metals - 6010A (TAL)	HNO3 to pH <2
B1BK40		W			1x500-mL P	IC Anions - 300.0	Cool 4C
B1BK40		W			1x20-mL P	Activity Scan	None

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	~~DURATEK~~ D. P. CONNOLLY		NOV 22 2004 1400	FED EX			
Relinquished By			Date/Time	Received By			Date/Time
Fed Ex			11-23-04 / 0950				11-23-04 / 0950
Relinquished By			Date/Time	Received By			Date/Time
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S = Soil		DS = Drum Solid	
SE = Sediment		DL = Drum Liqui	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wine	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

Lionville Laboratory Incorporated
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford **Date:** 11-23-04

Purchase Order / Project# / SAF# / SOW# / Release #: 105.005

LvLI Batch # : 0411L256 **Sample Custodian:** D Smith

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped — Carrier FedEx — Airbill# 7927 8428 2410

2. Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	Comments
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No		
4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No		
5. Samples received cooled or ambient?	Temp 6.8 °C		Cooler # SAW106	
6. Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	
7. coc signed and dated?	☑ Yes	☐ No		
8. Sample containers are intact?	☑ Yes	☐ No		
9. All samples on coc received? All samples received on coc?	☑ Yes	☐ No		
10. All sample label information matches coc?	☑ Yes	☐ No		
11. Samples properly preserved?	☑ Yes	☐ No		
12. Samples received within hold times? Short holds taken to wet lab?	☑ Yes	☐ No		
13. VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A	
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A	
15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No		
16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)	☐ Yes	☐ No	☑ No Discrepancies	

SR-002-B